

### **Abstract of the Disclosure**

The invention relates to primer-specific and mispair extension assays for identifying gene variations, such as in different genotypes or subtypes of a given genotype. The assay includes extending a nucleic acid sequence from a patient sample with extension products of the primer, characterizing the extension products, and comparing the extension products with known nucleic acid sequences of various genotypes for determining the genotype of the nucleic acid sequence extended. In the assay, at least one primer or the dNTPs is labeled.